LESSON MAKER PRO

Power of Ten Moves

Track how digits change place when you multiply or divide.

GRADE 5 · 5.NBT.A.3

5.NBT.A.3 "Using models and quantitative reasoning, explain that in a multi-digit number, including decimals, a digit in any place represents ten times what it represents in the place to its right and 1/10 of what it represents in the place to its..."

NAME _____ DATE _____

PLACE VALUE SHIFTS

Each place is worth 10 times the place to its right. When you multiply by 10^n, the decimal point moves n places right in the written number. When you divide by 10^n, it moves n places left. Add zeros when you need them to hold places.

WORKED EXAMPLE

Find 0.46×10^3.

1. 10^3 means multiply by 10 three times.
2. $0.46 \times 10 = 4.6$, then $4.6 \times 10 = 46$.
3. $46 \times 10 = 460$. Write a zero to hold the ones place.

Answer: 460

PRACTICE 6 problems

1 Find 3.7×10^2.

ANSWER _____

2 Find 8.04×10^3.

ANSWER _____

3 Find $562 \div 10^2$.

ANSWER _____

4 Find 0.009×10^3.

ANSWER _____

5 Find $65.3 \div 10^3$.

ANSWER _____

6 Use the place-value table. How many times as much is the digit 6 worth in 4.62 as it is in 4.062? Explain.

PLACE-VALUE TABLE

Number	Ones	Tenths	Hundredths	Thousandths
4.62	4	6	2	
4.062	4	0	6	2

ANSWER _____

APPLY IT Show your work

1 A student uses 0.125 kilogram of clay to make one tiny sculpture. How many kilograms of clay would the student need for 10^2 sculptures?

WORK SPACE

ANSWER _____

2 A game replay lasts 4,280 milliseconds. There are 10^3 milliseconds in 1 second. How many seconds does the replay last?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A skateboard app records 0.0036 kilometer for one short roll. It records 10^3 identical rolls, then divides the total distance into 10^2 equal parts. How many kilometers are in each part? Explain how the powers of 10 affect your result.

WORK SPACE AND ANSWER

ANSWER KEY

Power of Ten Moves

GRADE 5 · 5.NBT.A.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find 3.7×10^2.	**370**
2	Find 8.04×10^3.	**8,040**
3	Find $562 \div 10^2$.	**5.62**
4	Find 0.009×10^3.	**9**
5	Find $65.3 \div 10^3$.	**0.0653**
6	Use the place-value table. How many times as much is the digit 6 worth in 4.62 as it is in 4.062? Explain.	**10 times as much. The 6 is worth 0.6 in 4.62 and 0.06 in 4.062.**

PART 2 · APPLY IT

1. **12.5 kilograms** 10^2 is 100, so multiply 0.125 by 100 to get 12.5 kilograms.
2. **4.28 seconds** Divide 4,280 by 10^3, or 1,000, to get 4.28 seconds.

CHALLENGE

Each part is 0.036 kilometer. Multiplying by 10^3 gives 3.6 kilometers, and dividing by 10^2 gives 0.036 kilometer.

Accept answers with or without a trailing zero after the decimal point. For written explanations, accept correct place-value reasoning even if students describe digits shifting instead of the decimal point moving.